



Macroeconomic Determinants of Private Investment in Kenya: An ARDL Approach (1980-2023)

Mercy J. Kiprop¹ & Lawrence K. Kibet²

¹Kabarak University, Kenya

²Egerton University, Kenya

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Abstract

Private investment is one of the main contributors to economic growth and development in both developed and developing countries. As a result of this Kenyan government in 2023 pursued several tax and regulatory reforms aimed at improving the investment climate, including removing the VAT on exported services, reimbursing verified tax refund claims within six months, and increasing credit access to the private sector. This study sought to assess the determinants of private investment in Kenya over the period from 1980-2023 to determine the key factors that may have enhanced or constrained the private investment growth. To achieve this, this study employed the Autoregressive Distributed Lag (ARDL) technique. The findings demonstrate that GDP per capita, credit to the private sector, and openness, with significant coefficients (all at 0.05 level) of 0.930, 0.229, and 0.409, respectively, have a positive effect on private investment, while external debt and real interest rate with coefficients of -0.186 and -0.143, respectively, have a negative effect on private investment in the long-run. In addition, the results show that External debt, GDP per capita, credit to the private sector, and openness, with significant coefficients as 0.147, 1.438, 0.286, and 0.325, respectively, have a positive effect on private investment while the real interest rate, with a coefficient of -0.325, hurts private investment in the short run. It is herein recommended that policies that contribute to GDP growth, improved credit to the private sector, reduced external debt, more openness, and reduced real interest rate shall boost the level of private investment in Kenya.

Introduction

Private investment is crucial for economic growth and development in both developed and developing countries. This is because through investment, new technology can be adopted, employment opportunities can be created, incomes can grow, and living conditions of the people can improve, ultimately leading to alleviation of poverty (World Bank, 2019). Technology, employment and poverty are among the main problems facing most economies of developing countries such as Kenya and it is through investment that long term solutions can be realized. Hence private investment can be regarded as the cornerstone of renewed economic growth in developing countries and therefore countries wishing to put their economies on a faster and stable growth path will have to put measures into place aimed at promoting the level of private investment.



According to Akçay and Karasoy (2020), countries that give priority to investment achieve faster rates of economic growth and development. Hence, investment is the main factor that differentiates industrialised countries from developing countries. According to Nwankwo & Allison (2021), Investment is an essential tool used to reduce the level of illiteracy, enhance technological improvements, and increase economic growth. Investment activities can be undertaken by both the public sector and the private sector. Public investment finances the development of infrastructure (Resmini, 2019), while Private investment is essential for economic growth. This is because it encourages the business community to engage in economic activities by utilising resources to produce goods and services (Legass et al., 2022).

The trends of private investment in Kenya have generally not been impressive, leading successive governments to implement various policies aimed at enhancing private sector growth. For example, in 2023, Kenya pursued several tax and regulatory reforms aimed at improving the investment climate, including removing the VAT on exported services, reimbursing verified tax refund claims within six months or allowing the taxpayer to offset the claims against future tax liabilities, removing the tax on unrealised gains on employee-allocated shares for startup companies and increasing credit access to the private sector. Implementation of VAT refunds and offsets was still in progress in 2023. Despite regulatory reforms, businesses operating in Kenya continue to face burdensome bureaucratic processes and delays in obtaining necessary business licenses. Transparency International ranked Kenya 126 out of 180 countries in its 2023 Global Corruption Perception Index – reflecting a slight deterioration over 2022 and placing Kenya below regional and global averages. From empirical evidence, many countries have tried to encourage private investment by implementing various policies, but have not been successful; furthermore, studies on the determinants of private investment have had mixed results.

According to Milbourne et al. (2003), Kenya has experienced unbalanced changes in private investment since the 1970s, which led to the development and implementation of various policies and indicators to encourage private investors. Growth of private investment as a percentage of GDP has ranged between 7.6 per cent and 14 per cent according to the Kenya National Bureau of Statistics (KNBS) Economic Survey reports. This has therefore led Kenya to formulate policies and strategies, including providing incentives to local investors, to increase production in the country (Njuru, 2012). This study, therefore, sought to investigate the determinants of private investment in Kenya over the period from 1980 to 2023 to establish key factors that may have enhanced or constrained the private investment growth.

Literature Review

Akpalu (2002) used annual time series data from 1970 to 1994 to model the determinants of private investment in Ghana. The study employed the Engle-Granger Two-Step procedure and the Johansen multivariate test, with the results showing that private investment in the short run responds more to real per capita income growth and credit availability.

Ayeni (2014) did a study on determinants of domestic private investment in the Nigerian economy. Among the potential determinants of domestic private investment, interest rates and credit to the private sector of the economy were identified. Bwonde (2000) examined the effects of macroeconomic reform policy indicators on private investment. The findings showed that private investment is positively affected by economic growth, real interest rate, and private sector credit. However, lagged real interest rates and external debt hurt private investment.

Enabulu and Epur (2022) examined the macroeconomic determinants of domestic private investment in the Nigerian economy for the period 1981-2020. The ARDL results were mixed: there



was a long-run equilibrium relationship among the selected indicators, with credit to the private sector and economic growth hurting domestic private investment.

Kwode (2024) investigated the pattern, performance and relationship between domestic private investment and some selected macroeconomic fundamentals in Nigeria from 1991 to 2020. The study employed time series data and utilised the multiple regression analytical method. The results showed that there exist relationships (both short-term and long-term) between domestic private investment and the key selected macroeconomic indicators, which include Lending rates and real GDP.

Methodology

This study employed secondary data sources, limited to the period 1980-2023, where five determinants of private investment were used to estimate the private investment model. The choice of the study period is dependent on data availability for most of the variables used in the study. The data was drawn from the World Bank's World Development Indicators.

Based on the theoretical and empirical review, the following functional model consists of macroeconomic variables.

$$P_i = f(EXD, GDPPC, CPS, OPENNESS, RIR) \quad (1)$$

where P_i = Private Investment; EXD = External Debt; GDPPC = GDP per capita constant; CPS = Credit to Private Sector; OPEN = Openness; RIR = Real Interest Rate)

Where P_i is the dependent (endogenous) variable being measured by annual percentage growth, Exogenous (independent) variables include: EXD, which is External Debt, GDPPCC, which is GDP per capita constant, Open, which is openness of the economy, i.e., the sum of imports and exports as a ratio of GDP, and RIR, which is the Real Interest Rate as an annual percentage. The study utilised the ARDL model to assess the short-run and long-run effects of independent variables on the dependent variable. The model explains that private investment (P_i) is subject to changes in External Debt (EXD), GDP per capita (constant, GDPPCC), Credit to the Private Sector (CPS), Openness (OPEN), and Real Interest Rate (RIR).

Therefore, the ARDL model specified for this study is as follows:

$$\ln P_{i_t} = a_0 + a_1 \ln EXD_t + a_2 \ln GDPPC_t + a_3 \ln CPS_t + a_4 \ln OPEN_t + a_5 RIR_t + u \quad (2)$$

Where: $\ln P_i$ is log (natural logarithm) of Private Investment, $\ln EXD$ is log of External Debt, $\ln GDPPC$ is log of GDP per capita, $\ln CPS$ is log of Credit to Private Sector, $\ln OPEN$ is log of Openness and RIR is Real Interest Rate and all variables are in natural logarithm with the exception of real interest rate since it has negative values. The advantage of transforming variables into log form makes it easier to interpret the coefficients as elasticities.

Results and Discussion

Table 1 presents unit root results. The results show that private investment and real interest rate are stationary at their level form. Although external debt, GDP per capita (constant), credit to the private sector, and openness are non-stationary, they become stationary at their first difference.



Table 1: Results of the Unit Root Test

Variables	ADF		Order of integration
	TEST STATISTICS		
	Variable at level	Variable at first difference	
<i>lnPi</i>	-2.947*	-	I(0)
<i>lnEXD</i>	-1.065	- 3.172	I(1)
<i>lnGDPPC</i>	1.217	- 3.383	I(1)
<i>lnCPS</i>	- 0.895	- 6.480	I(1)
<i>lnOPENNESS</i>	-1.050	- 5.389	I(1)
<i>RIR</i>	- 3.297	-	I(0)

NB: The null hypothesis indicates that the series is non-stationary or contains a unit root.

The lag length in the ADF test is based on the Akaike Information Criterion (AIC), and variables were subject to Δ is first difference.

Cointegration test

Results of the bounds test procedure for cointegration analysis between private investment and its determinants are presented in the table below.

Table 2: Bounds Test for Cointegration

Level	90% Level		95% Level		99% Level	
6	I(0) 2.26	I(1) 3.35	I(0) 2.62	I(1) 3.79	I(0) 3.41	I(1) 4.68
Calculated F-statistics: $F_{IP}(IP/Pi, EXD, GDPPC, CPS, OPENNESS, RIR)$						5.740

Source: Critical values are obtained from Pesaran (2001)

Table 2 shows that the F-statistic of the joint null hypothesis of lagged level variables (i.e. variable addition test) of the coefficients are zero and is rejected at the 5% significance level. In addition, the empirical F-statistic, which is 5.740, exceeds the upper bound of the critical value band and hence the null hypothesis of no cointegration (i.e. long-run relationship) between real private investment and its determinants is rejected at the 5% significance level. This implies that there is a long-run relationship between private investment and its determinants.

Other diagnostic test

To ensure the validity of the study's results, free from econometric problems, the following diagnostic tests were conducted. Autocorrelation test, heteroscedasticity test, rampsey reset test as well as model stability. The results for the autocorrelation test by Godfrey (1978) gave a Chi-square statistic of 0.180 (at a lag of 1, df of 1 and prob > χ^2 of 0.671, showing that there is no evidence of an autocorrelation problem.

Results of the heteroscedasticity test give the χ^2 -statistic of 42 and prob > $\chi^2_y = 0.4274$, hence indicating that there is no problem of heteroscedasticity in the model. Therefore the null hypothesis of homoscedasticity is accepted at 5% level of significance. The results on Ramsey Rreset test showed an F-statistic of 9.05 with prob > 0.002, hence the model has no omitted variables. The results show that the key determinants of private investment have been included in the model.

Test for Model Stability

To ensure that the estimated model is stable in the long-run it was necessary to test for parameter stability. The technique used in this study was based on the cumulative sum (CUSUM) and the



cumulative sum of squares (CUSUMSQ) test. Figure 1 shows that both the CUSUM and CUSUMSQ plots lie within the 5% critical bound hence providing evidence that the parameters of the model are stable over the study period.

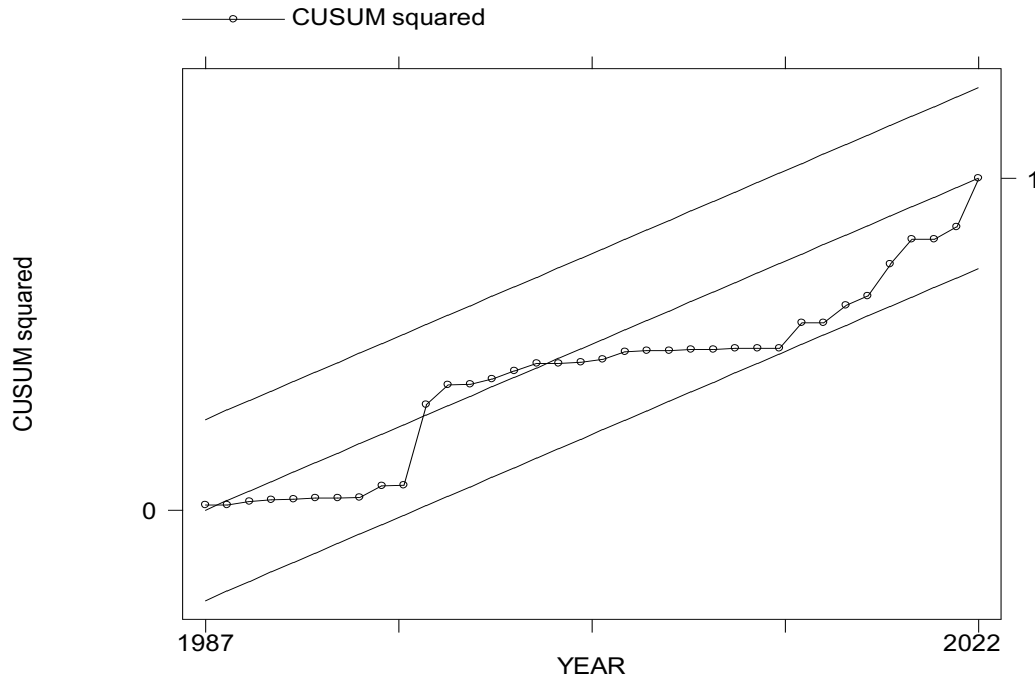


Figure 1: Plot of Cumulative Sum of Squares of Recursive Residuals

The straight parallel lines in Figure 1 represent critical bounds at 5% significance level.

Results of the Long-Run ARDL Model of Private Investment in Kenya

Since private investment and its determinants are cointegrated, the long-run coefficients of the ARDL model were estimated, and the results are presented in Table 3.

Most of the estimated coefficients tally with a priori theoretical expectations. External debt (with significant coefficient of -0.186 at 5% level) showed that it had an inverse relationship with private investment in Kenya in the long run. This indicates that huge external debt in an economy hurts private investment, and these results are consistent with studies done by Ronge & Kimuyu (1997) in Kenya and Mbang (2002) in Cameroon.

The coefficient of real GDP is statistically significant at 5% level and illustrates that an increase in GDP by 1% will lead to an increase in real private investment by 0.930%. The results confirm to most findings in many empirical studies in the literature. Specifically, it concurs with studies by Ibrahim (2000), Asante (2000), and Akpalu (2002), among other studies.



Table 3: Estimated Long-Run Coefficients using the ARDL Model

ARDL(1,1,0,1,1,0) selected based on SBC		Dependent Variable: $\ln Ipt$	
Regressor	Coefficient	Standard Error	T-Ratio
$\ln Pi$	0.531	0.127	4.17
$\ln EXD$,	-0.186	0.059	-3.14
$\ln GDPPC$	0.930	0.395	2.35
$\ln CPS$,	0.229	0.111	2.07
$\ln OPENNESS$,	0.409	0.180	2.27
RIR	-0.143	0.054	-2.64

The coefficient of credit to private sector investment was positive (0.229), indicating that as credit to the private sector increases, private investment also increases in the long run. Trade openness has a significantly positive coefficient of 0.409; thus, increased trade liberalisation has a positive effect on long-term private investment. Real interest rate (with a coefficient of -0.143) has a significant negative impact on private investment in Kenya.

Results of the Short-Run Dynamic Model

After estimation of the long-run cointegrating model, the short-run model values were estimated using the Table.4, giving the results of the estimated error-correction model technique. The model selected is based on the SBC, which is consistent with the long-run results. The coefficient of external debt was 0.147 and hence has a positive impact on private investment in the short run. That is, an increase in external debt stimulates an increase in investment. The results are consistent with the findings of Bende-Nabende and Slater (2003) for Indonesia. This means that most developing countries rely on loans to boost investment.

The GDP per capita constant (with a coefficient of 1.438) has a positive effect on private investment in the short run, which is consistent with theory. Credit to the private sector maintained its positive sign (0.286) in the short run and is consistent with the long-run results. This implies that increased credit availability to the private sector has enabled a rise in private investment in Kenya. This concurs with the findings by Bwonde (2000), where there is a direct relationship both in the long run and the short run.

The coefficient of openness (0.325) was significant, which implied that it had a positive influence on private investment. This demonstrates that if the government minimises trade barriers, it will create a conducive environment for private investment, which will increase the level of private investment.

Table 4: Estimated Short-Run Coefficients of the ARDL Model

ARDL(1,1,0,1,1,0) selected based on SBC		Dependent Variable: $\ln pi$	
Regressor	Coefficient	Standard Error	t-ratio
constant	- 2.306	1.709	-1.35
$\Delta \ln EXD$	0.147	0.072	2.03
$\Delta \ln GDPPC$	1.438	0.532	2.70
$\Delta \ln CPS$	0.286	0.131	2.18
$\Delta \ln openness$	0.325	0.121	2.67
RIR	-0.325	0.104	-3.14

The coefficient for real interest rate (-0.325) was significant, indicating that an increase in the real interest rate will lead to a decrease in private investment. This confirms the neoclassical theory of



investment, where the real interest rate is treated as a key component of the user cost of capital and therefore negatively affects private investment.

Conclusion

This study was to empirically establish the determinants of private investment in Kenya for the period 1980-2023. The study employed modern time series econometric techniques, including tests for stationarity, cointegration, and error correction. The primary objective was to obtain relevant and consistent results that can be used to formulate policies to encourage private investment in Kenya. In this study, most of the selected determinants had a significant impact on private investment in Kenya. Recommendations emanating from this study are that policies that decrease external debt stimulate GDP growth, encourage openness, improve credit to the private sector and reduce real interest rates should boost private investment.

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